

What is claimed is:

1. A system for catalytic reforming of naphtha, said system comprising at least one reactor comprising a monolithic catalyst having honeycomb-type structure, wherein said naphtha passes through said reactor along a flow path from a reactor inlet to a reactor outlet.

5 2. The system of claim 1 wherein said flow path is substantially axial.

10 3. The system of claim 1 wherein geometry of said monolithic catalyst varies along said flow path.

15 4. The system of claim 3 wherein wall thickness of said monolithic catalyst varies along said flow path.

5 5. The system of claim 4 wherein said wall thickness increases or decreases along said flow path in the direction of flow.

20 6. The system of claim 3 wherein equivalent diameter of said monolithic catalyst varies along said flow path.

7. The system of claim 6 wherein said equivalent diameter increases or decreases along said flow path in the direction of flow.

25 8. The system of claim 1 wherein said monolithic catalyst comprises substantially uniform geometry along said flow path.

9. The system of claim 1 wherein composition of said monolithic catalyst varies along said flow path.

30 10. The system of claim 1 wherein said monolithic catalyst comprises gamma alumina.

11. The system of claim 10 wherein said gamma alumina is coated on a ceramic honeycomb material.
- 5 12. The system of claim 1 wherein said monolithic catalyst comprises Pt, Pd, Re, Ir, or Sn.
13. The system of claim 1 wherein said monolithic catalyst comprises chloride.
- 10 14. The system of claim 1 wherein said monolithic catalyst has an open frontal area percentage of from about 25 to about 90%, a cell density of from about 10 to about 2000 cpsi, and a wall thickness of from about 50 to about 1000 μ m.
- 15 15. The system of claim 1 wherein said reactor further comprises heat exchange surfaces.
- 20 16. A system for catalytic reforming of naphtha, said system comprising a plurality of reactors connected in series, said plurality of reactors comprising a first reactor and at least one subsequent reactor, wherein each reactor of said plurality of reactors comprises a monolithic catalyst having honeycomb-type structure, and wherein said naphtha passes through said plurality of reactors sequentially beginning at said first reactor.
- 25 17. The system of claim 16 wherein at least one reactor of said plurality of reactors comprises an axial flow path.
18. The system of claim 16 comprising three or four reactors.
- 30 19. The system of claim 16 wherein said monolithic catalyst of at least two reactors of said plurality of reactors comprises substantially the same geometry.

20. The system of claim 16 wherein said monolithic catalyst of at least two reactors of said plurality of reactors comprises different geometry.

5 21. The system of claim 16 wherein the percentage of open frontal area of said monolithic catalyst of said first reactor is highest.

22. The system of claim 16 wherein equivalent diameter of said monolithic catalyst of said first reactor is smallest.

10 23. The system of claim 16 wherein wall thickness of said monolithic catalyst of said first reactor is smallest.

15 24. A process for catalytic reforming of naphtha, said process comprising passing naphtha through at least one reactor comprising a monolithic catalyst having honeycomb-type structure, wherein said naphtha passes through said reactor along a flow path from a reactor inlet to a reactor outlet.

20 25. The process of claim 24 wherein said flow path is substantially axial.

26. The process of claim 24 wherein geometry of said monolithic catalyst varies along said flow path.

27. The process of claim 26 wherein wall thickness of said monolithic catalyst varies along said flow path.

25 28. The process of claim 27 wherein said wall thickness increases or decreases along said flow path in the direction of flow.

30 29. The process of claim 26 wherein equivalent diameter of said monolithic catalyst varies along said flow path.

30. The process of claim 29 wherein said equivalent diameter increases or decreases along said flow path in the direction of flow.

5 31. The process of claim 24 wherein composition of said monolithic catalyst varies along said flow path.

32. The process of claim 24 wherein said monolithic catalyst comprises gamma alumina.

10 33. The process of claim 32 wherein said gamma alumina is coated on a ceramic honeycomb material.

15 34. The process of claim 24 wherein said monolithic catalyst comprises Pt, Pd, Re, Ir, or Sn.

35. The process of claim 24 wherein said monolithic catalyst comprises chloride.

36. The process of claim 24 wherein said monolithic catalyst comprises substantially uniform geometry along said flow path.

20 37. The process of claim 24 wherein said monolithic catalyst has an open frontal area percentage of from about 25 to about 90%, a cell density of from about 10 to about 2000 cpsi, and a wall thickness of from about 50 to about 1000 μ m.

25 38. The process of claim 24 wherein said reactor further comprises heat exchange surfaces.

30 39. A process for catalytic reforming of naphtha, said process comprising feeding said naphtha to a system comprising a plurality of reactors connected in series, said plurality of reactors comprising a first reactor and at least one subsequent reactor, wherein each reactor of said plurality of reactors comprises a monolithic catalyst

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having honeycomb-type structure, and wherein said naphtha passes through said plurality of reactors sequentially beginning at said first reactor.

40. The process of claim 39 wherein at least one reactor of said plurality of reactors
5 comprises an axial flow path.

41. The process of claim 39 comprising three or four reactors.

42. The process of claim 39 wherein said monolithic catalyst of at least two reactors
10 of said plurality of reactors comprises substantially the same geometry.

43. The process of claim 39 wherein said monolithic catalyst of at least two reactors
of said plurality of reactors comprises different geometry.

15 44. The process of claim 39 wherein the percentage of open frontal area of said
monolithic catalyst of said first reactor is highest.

45. The process of claim 39 wherein equivalent diameter of said monolithic catalyst
of said first reactor is smallest.

20 46. The process of claim 39 wherein wall thickness of said monolithic catalyst of
said first reactor is smallest.

25 47. A reactor for catalytic reforming of naphtha, said reactor comprising a
monolithic catalyst having honeycomb-type structure, wherein said monolithic catalyst
has an open frontal area percentage of from about 25 to about 90%, a cell density of
from about 10 to about 2000 cpsi, and a wall thickness of from about 50 to about
1000 μ m.

30 48. A reactor for catalytic reforming of naphtha, said reactor comprising a
monolithic catalyst having honeycomb-type structure, wherein the geometry of said
monolithic catalyst is axially graded.